

# **NOAA/NCEP Analysis/Forecast Model Update**

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# Projection-Prioritized Seamless Suite

- **Seamless Suite of Forecast Products**
  - Focus depends on forecast projection (e.g. Weather ☐☐Climate)
  - Examples are:
- **0-24 h**
  - Severe weather (precipitation, winds, temperature)
  - Sensible weather focus
  - Aviation
  - Surface transportation
  - Hazards
- **1-3 days**
  - Synoptic systems
  - Jet streams
  - Define amplitude of extreme events
  - Oceans (waves, ocean state)
- **1-5 days**
  - Hurricane track & intensity
- **4-15 days**
  - Likelihood of extreme events
  - Regional scale impacts
- **16-60 days**
  - Changes in continental-scale regimes (AO, PNA)
  - MJO and tropical forcing
  - **1-12 months**
  - ENSO events
- All applications have a probabilistic component

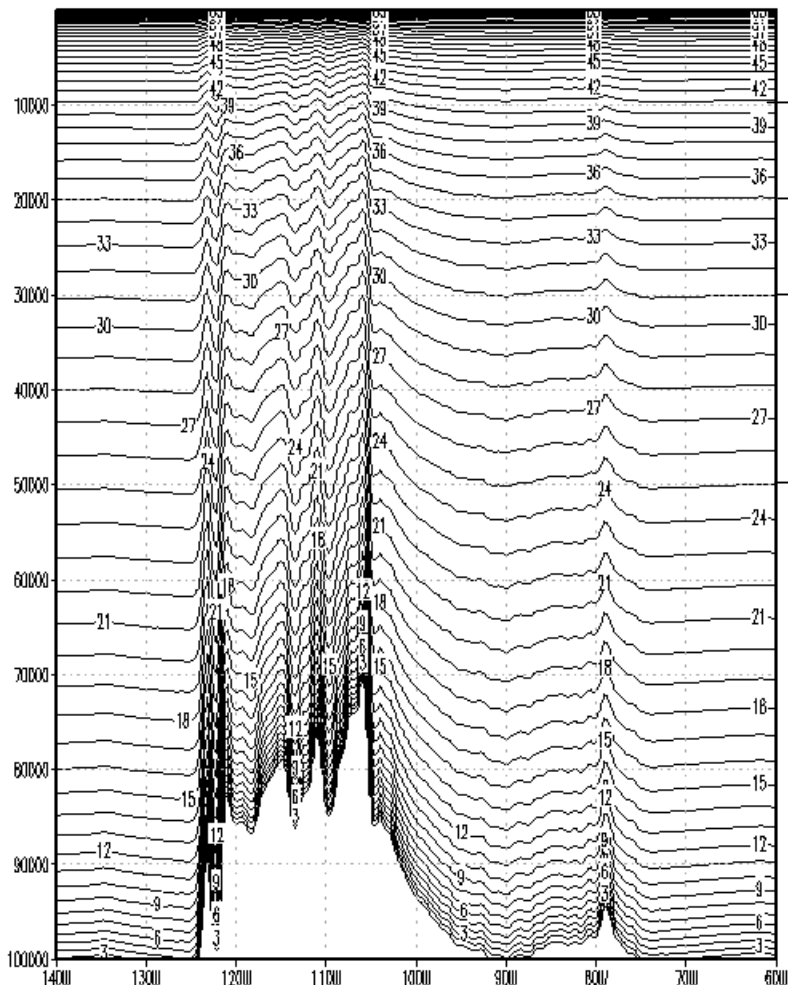
# NCEP Update

- **Most recent implementation:**
  - **May 2007**
    - **Change from SSI to GSI**
      - **Unifies global 3DVAR with mesoscale system**
      - **Background error defined in grid space instead of spectral space**
        - » **Allows use of situation dependent background errors**
      - **Data assimilation and physics done on hybrid sigma-pressure coordinate as well**
      - **Community support**
      - **Moving forward to Earth System Modeling Framework (ESRF)**
    - **Changed vertical scheme from pure sigma to sigma-pressure hybrid**
      - **Model surface remain terrain-following in the lower troposphere but become pure pressure surfaces in the stratosphere**
      - **Reduces vertical advection errors and pressure-gradient calculation errors in the upper part of the model**
    - **Inclusion of GPS(COSMIC)**
      - **Temps**
      - **Water vapor > 300 hPa**

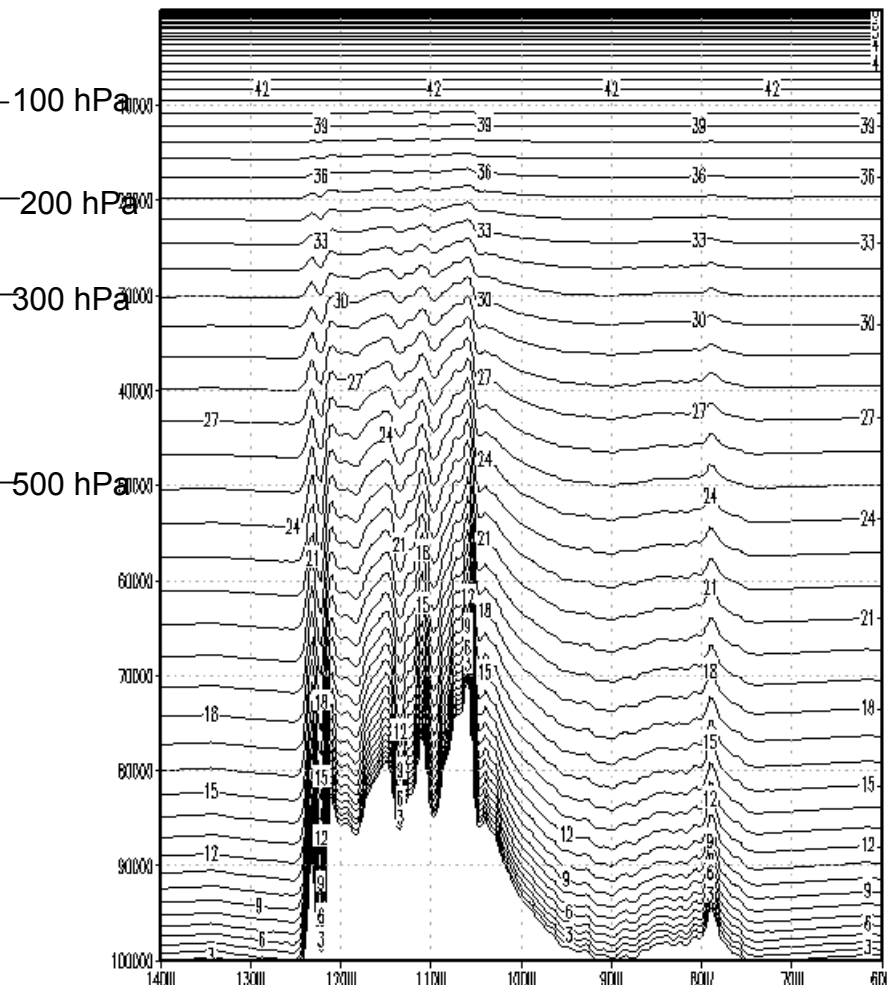
# NCEP Update

## Vertical coordinate comparison across North America

GFS Sigma Model Levels (lat=40N)



GFS Hybrid Model Levels (lat=40N)



# NCEP Update

- **Climate Forecast System Reanalysis and Reforecasts**

- **Reanalysis**

- **1979-present**
    - **Current GFS model T382L64**
    - **PGB, FLX, Ocean, Land @ 1x1 or gaussian res.**
    - **6hr time resolution**
    - **Available to public by mid-year 2009**

- **Reforecasts**

- **1979-present**
    - **T126L64**
    - **Each member separated by 30 hours**
    - **Each forecast run is for 1 year.**

# NCEP Update

- **Current Ozone Research to Operations**
  - **SBUV/2 version 8**
    - **NOAA-16,17, and 18**
  - **OMI total ozone**
    - **OMTO3**
    - **OMDOAO3**
  - **Additional ozone sources**
    - **NRT MLS**
    - **GOME-2**
    - **OMI Profile**
    - **HIRDLS**

# NCEP Update

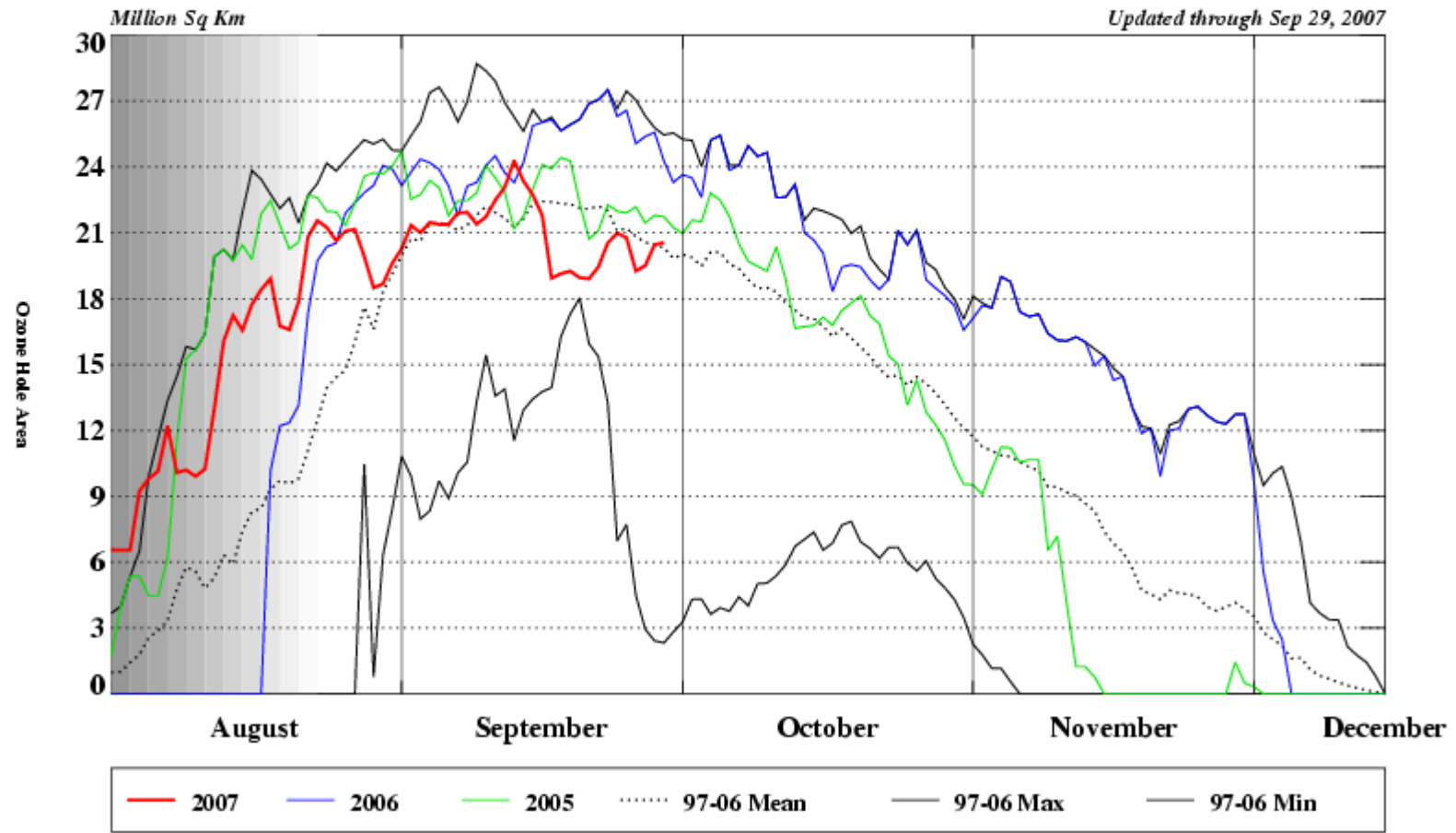
- **Other Modeling initiatives**
  - **Hurricane Models**
  - **Ocean Models**
  - **Ensemble Models**
    - NAEFS
  - **Land Surface Modeling**
  - **Air Quality**
    - 48 hr surface ozone forecasts
    - CMAQ
    - Joint effort with EPA

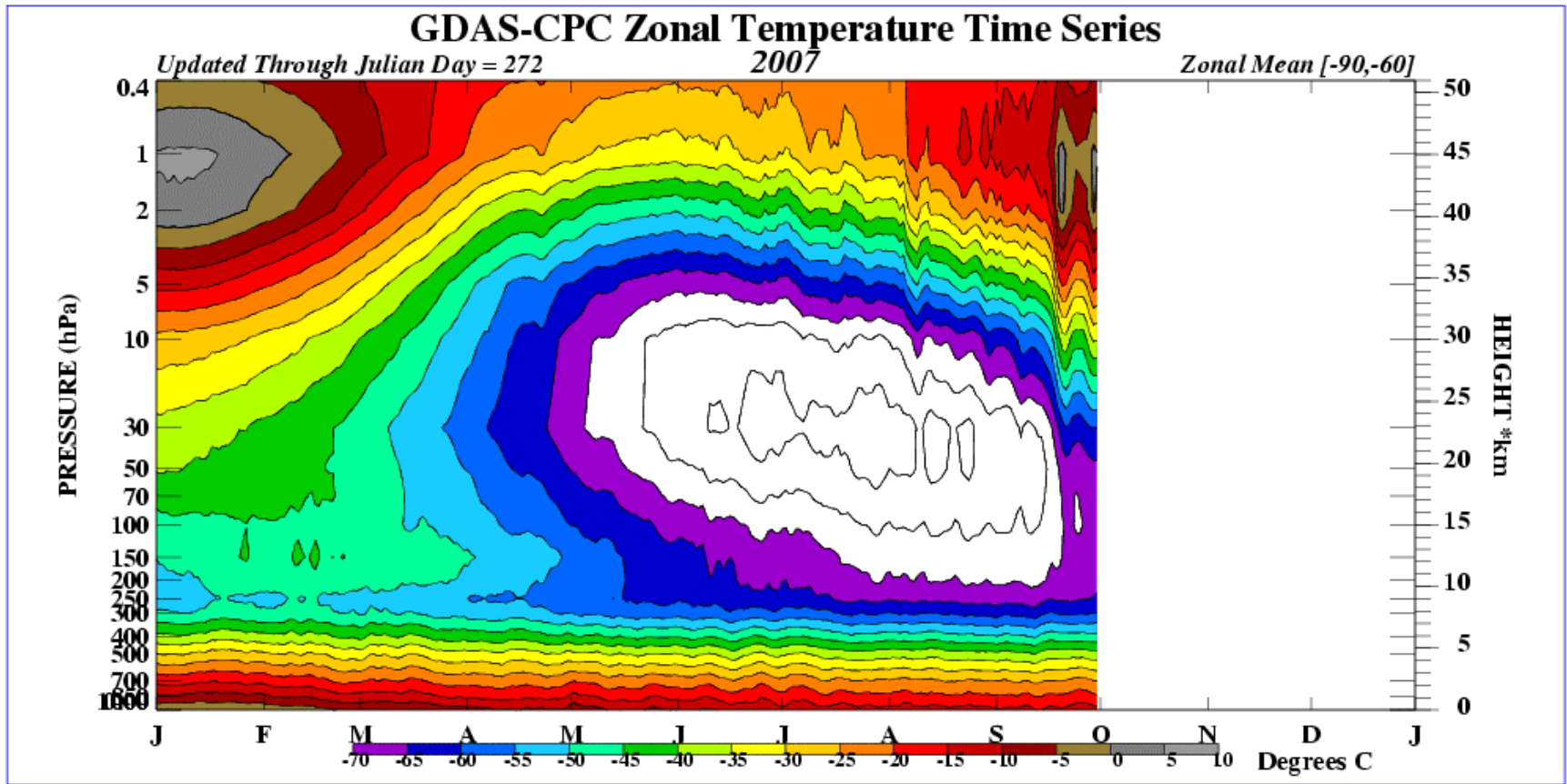
# 2007 Ozone Hole Update

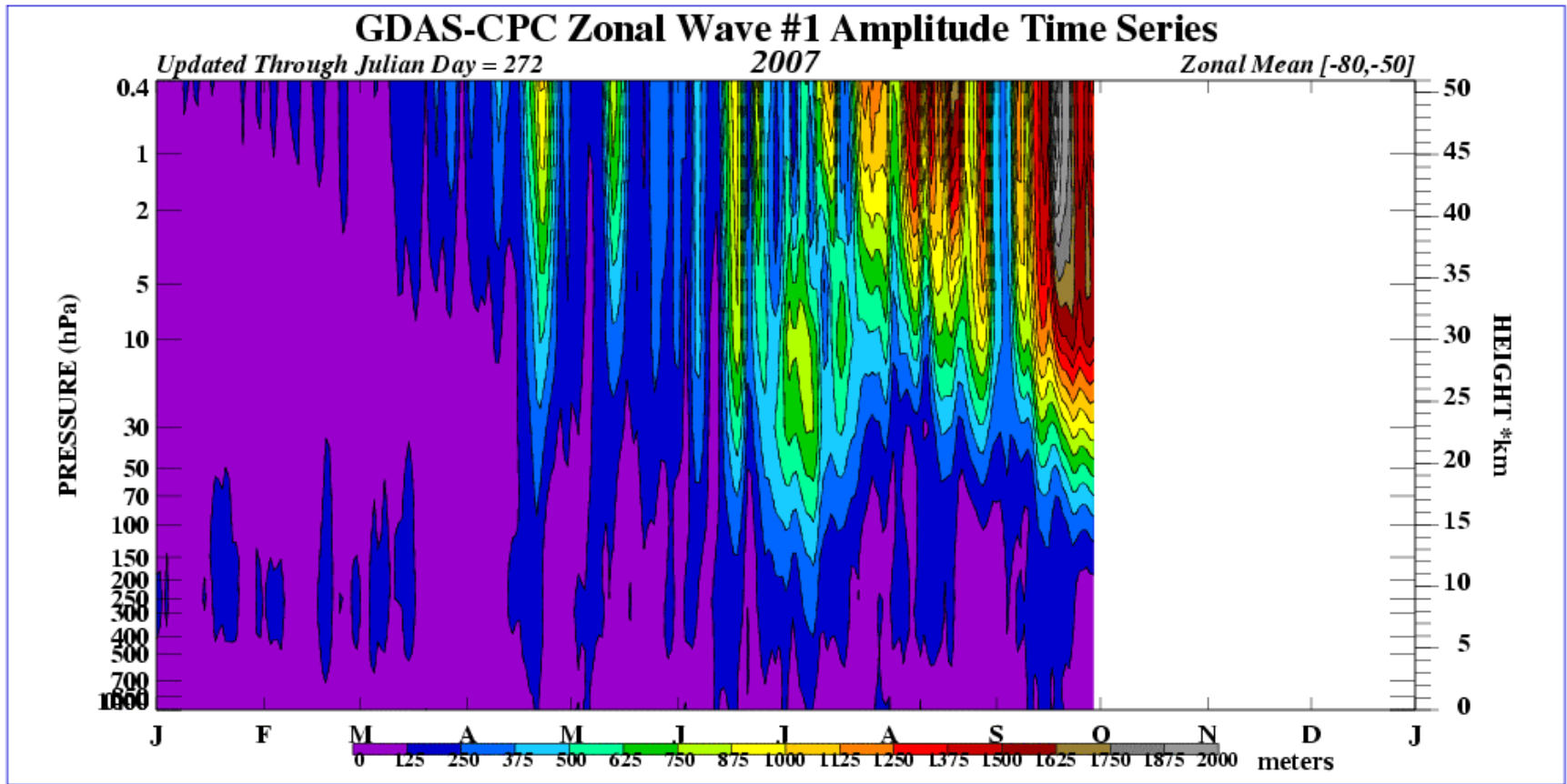
## 2007 Southern Hemisphere Ozone Hole Area

NOAA SBUV/2

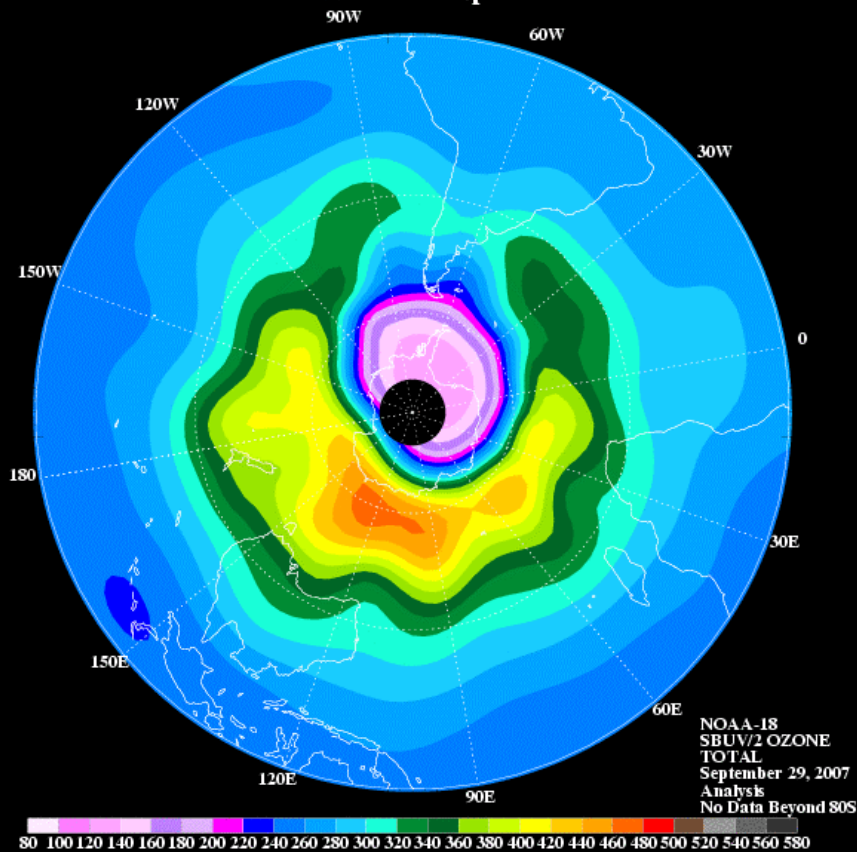
Current Year Compared Against Past 10 Years



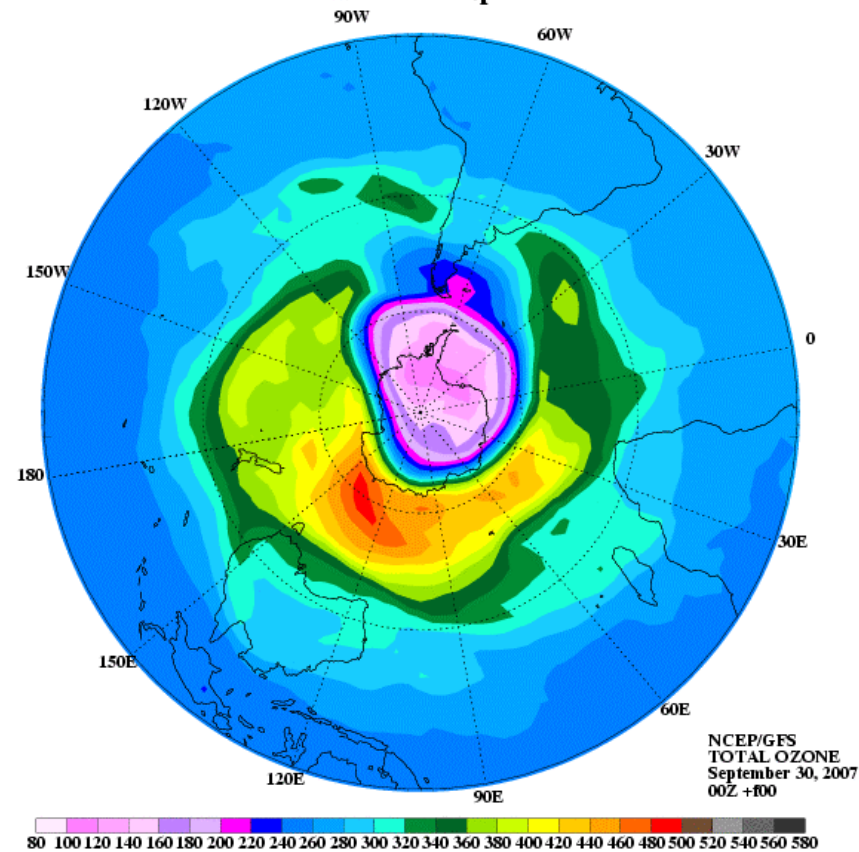




# **SBUV/2 TOTAL OZONE** **Southern Hemisphere**

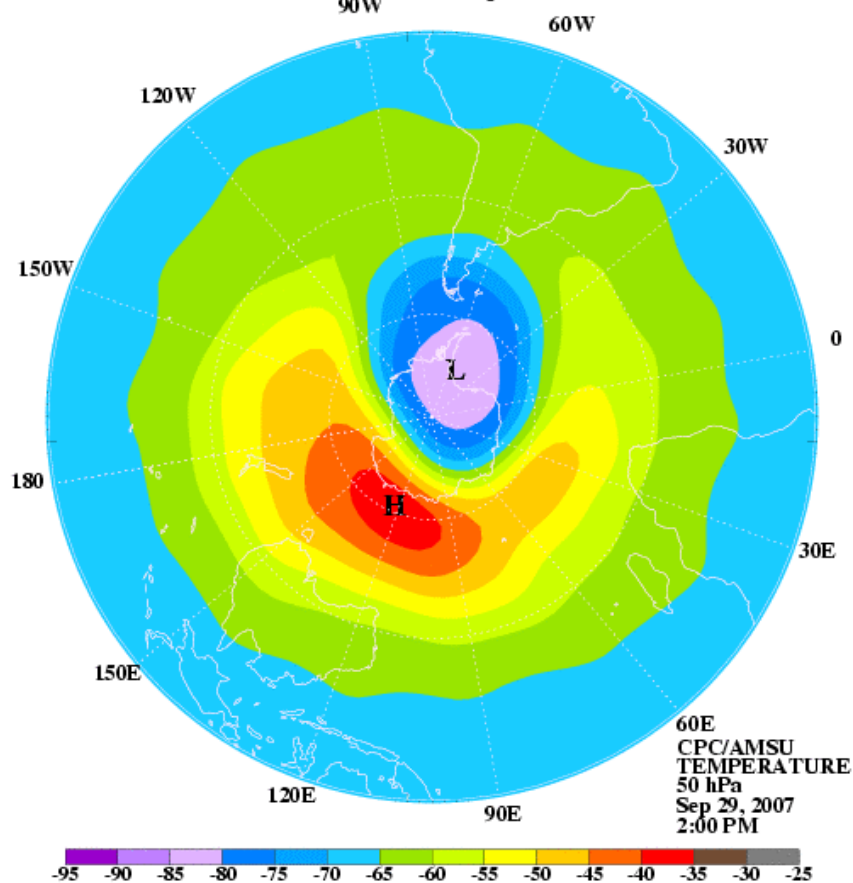


# **NCEP/GFS TOTAL OZONE** **Southern Hemisphere**



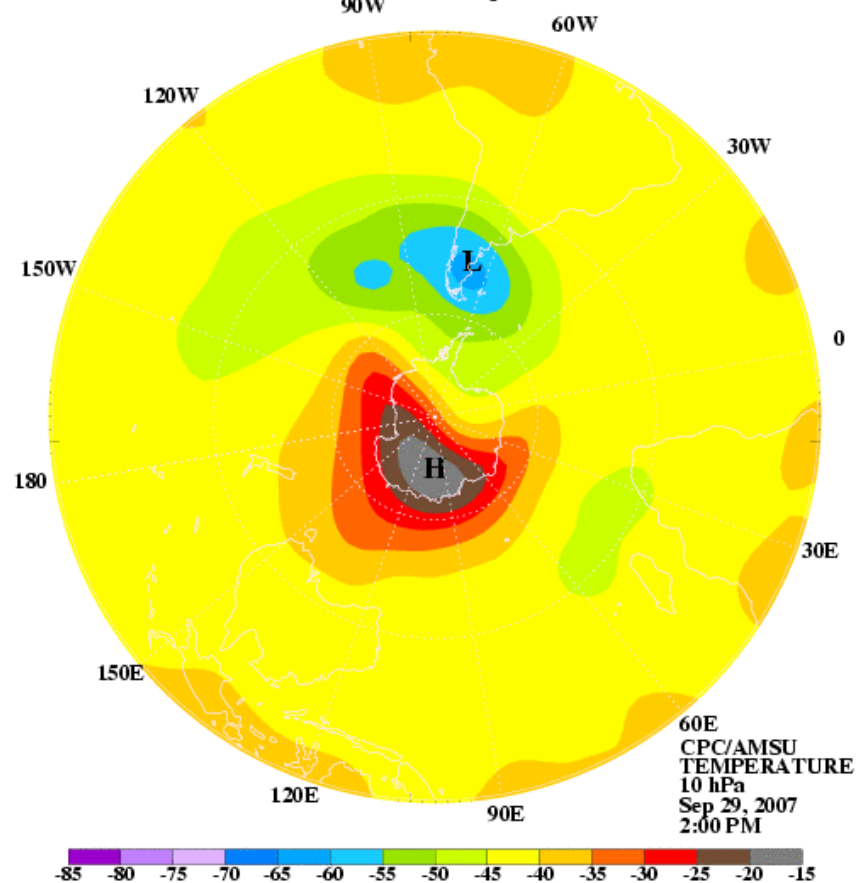
# NOAA-16 AMSU 50-hPa TEMPERATURE ANALYSIS

Southern Hemisphere



# NOAA-16 AMSU 10-hPa TEMPERATURE ANALYSIS

Southern Hemisphere



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